5)

$$\begin{cases} (V_1 - V_B)\, g_{m1} = V_A \cdot sC_1 \Rightarrow V_A = (V_i - V_B)\dfrac{g_{m1}}{sC_1} \\ (V_A - V_B)\, g_{m2} = V_B \cdot sC_2 \\ V_o = V_B \cdot \dfrac{G_1}{sC_3 + G_1} \Rightarrow V_o = V_B \cdot \dfrac{\frac{1}{C_3 R_1}}{s + \frac{1}{C_3 R_1}} \end{cases}$$

$$V_i \frac{g_{m1} g_{m2}}{sC_1} - V_B \frac{g_{m1} g_{m2}}{sC_1} - V_B g_{m2} = V_B sC_2$$

$$V_i \frac{g_{m1} g_{m2}}{sC_1} = V_B \left(sC_2 + g_{m2} + \frac{g_{m1} g_{m2}}{sC_1} \right)$$

$$V_i \frac{g_{m1} g_{m2}}{sC_1} = V_B \frac{s^2 C_1 C_2 + sC_1 g_{m2} + g_{m1} g_{m2}}{sC_1}$$

$$\frac{V_B}{V_i} = \frac{g_{m1} g_{m2}}{s^2 C_1 C_2 + sC_1 g_{m2} + g_{m1} g_{m2}}$$

$$T(s) = \frac{V_o}{V_i} = \frac{\frac{1}{C_3 R_1}}{s + \frac{1}{C_3 R_1}} \cdot \frac{\frac{g_{m1} g_{m2}}{C_1 C_2}}{s^2 + \frac{g_{m2}}{C_2} s + \frac{g_{m1} g_{m2}}{C_1 C_2}}$$

$$T(s) = \frac{w_o}{s + w_o} \cdot \frac{w_o^2}{s^2 + \frac{w_o}{Q} s + w_o^2} \Rightarrow w_o = 1{,}2526 \wedge Q = 1$$

Tomo $C_1 = C_2 = 10\,nF$ y $R_1 = 10\,k\Omega$.

$$\frac{w_o}{Q} = \frac{g_{m2}}{C_2} \Rightarrow \frac{1{,}2526}{1} = \frac{g_{m2}}{C_2} \Rightarrow g_{m2} = 12{,}53\,nS$$

$$w_o^2 = \frac{g_{m1} g_{m2}}{C_1^2} \Rightarrow 1{,}2526^2 = \frac{g_{m1} g_{m2}}{C_1^2} \Rightarrow g_{m1} = 12{,}52\,nS$$

$$w_o = \frac{1}{C_3 R_1} \Rightarrow 1{,}2526 = \frac{1}{C_3 R_1} \Rightarrow C_3 = 79{,}83\,\mu F$$